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09/485,759	02/15/2000	JORDAN J. GLOGAU	3220-60866	2173
23643	7590	10/31/2003	EXAMINER	
BARNES & THORNBURG 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204			LEE, GRACE C	
		ART UNIT		PAPER NUMBER
		2132		
DATE MAILED: 10/31/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	J
	09/485,759	GLOGAU ET AL.	
	Examiner Grace C. Lee	Art Unit 2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 02 January 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-29 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u>	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 11, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter).

Regarding claim 11, Nakamura discloses a method of data hiding comprising the steps of:

- Providing an encryption key; (see Fig 7, "Key")
- Generating an encryption sequence based on encryption key; (see Fig 7, "Encryption")
- Providing a carrier signal that conveys information unrelated to the encryption key; (page 55, section 6) and
- Embedding the encryption sequence into the carrier signal (page 55, section 6)

Regarding claim 25, it is a data hiding apparatus claim with limitations as per claim 11, and is rejected as per claim 11.

3. Claim 23 is rejected under 35 U.S.C. 102(a) as being anticipated by Podilchuk et al (Digital Image Watermarking Using Visual Models, "Podilchuk" hereinafter).

Regarding claim 23, Podilchuk discloses a method of exchanging data hiding in a carrier signal comprising the steps of:

- generating a signal including hidden data ("watermark sequence") by transforming a carrier signal from a first domain into a second domain (see page 103-104, section 4.1, the watermark insertion paragraph at equation 1), embedding a message into the carrier signal in the second domain (see figure 1, "Encoder")
- sending the signal including hidden data to a receiving location; and
- obtaining the message from the signal including hidden data at the receiving location by transforming the signal including hidden data into the second domain and extracting the message (see figure 1, "Decoder")

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 6-9, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koninkl Philips Electronics NV (EP 0 359 325 A1, "Koninkl" hereafter) in view of Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter).

Regarding claim 1, Koninkl discloses a method of data hiding comprising the steps of:

- Providing a message (col 1, line 6, an additional information signal; "d" in Fig 3)
- Providing a carrier signal that conveys information unrelated to the encrypted message ("b0-b7" in Fig 3; col 1, line 3, modifying means constructed to modify the series of data words; col 2, line 31-34, the bits of the data words are not correlated with the bits of the additional information signal); and

- Embedding the message into the carrier signal by performing an exclusive-OR of the message with a first portion of the carrier signal (col 5, line 1-5)

Koninkl fails to teach to provide an encrypting sequence and have the message encrypted before embedding it into the carrier signal in the steps of hiding data. However, encrypting the message before embedding it into the carrier signal will provide security of transmission. Nakamura discloses a unified coding algorithm for processing of both text and dithered image. The algorithm allows text data to be embedded into image. An encryption scheme can be used in conjunction with the proposed algorithm by using the encrypted text instead of the regular ASCII text (page 55, 6. Encryption of Text Data). In order to generate an encrypted text and have the encrypted text embedded into image, an encrypted sequence is needed. As seen in Fig 7, text and key are fed into encryption box to get encrypted text. It is implicitly taught by Nakamura that the key (in Fig 7) is the encrypting sequence. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to include providing an encrypting sequence and having the message encrypted before embedding it into the carrier signal in the data hiding steps as taught by Nakamura for the purpose of secure transmission. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Koninkl to obtain the claimed invention.

Regarding claim 2, Koninkl discloses embedding the message into the carrier signal. However, Koninkl fails to teach the carrier signal is a digital image. Nakamura discloses test data to be embedded unto image (last sentence on the left of page 50). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use a digital image as a carrier signal as taught by Nakamura for the purpose of hiding data in graphics. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Koninkl to obtain the claimed invention.

Regarding claim 3, Koninkl discloses using an Exclusive OR operation of additional information signal and other bits of data words to determine the logic values of less significant bits (col 3, 1st paragraph) to meet the limitation of claim 3.

Regarding claims 6-8, Koninkl discloses using recovery means to retrieve message in the receiving location (col 3, line 8-15). However, Koninkl fails to teach using a key to decrypt the message. Nakamura discloses only the receiver who has the proper key can recover both imagery and text data. The third party, without the key, can recover only the image. (page 55, the 3rd sentence on the right column; also see Fig 7). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to decrypt the encrypted message using the encrypting key as taught by Nakamura for the

purpose of only the person with a key can read the message. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Koninkl to obtain the claimed invention.

Regarding claim 9, Koninkl discloses embedding a message in a carrier signal. However, Koninkl fails to teach encrypted the message first. Nakamura discloses embedding the encrypted test in the image (page 55, the first sentence on the right column). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to provide a pre-encrypted message as taught by Nakamura for the purpose of making the data hiding more complicated. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Koninkl to obtain the claimed invention.

Regarding claims 19-22, Koninkl discloses after transmission the bits "d" of the additional information signal can be recovered simply by means of subjecting the least significant bits b0* and the most significant bits b7 of every the nth data word received to an Exclusive OR operation. It is implicitly taught by Koninkl that message extraction information is embedded in a carrier signal. Koninkl fails to teach embedding an encrypted message into a first portion of a carrier signal. Nakamura teaches encrypted message into a first portion of a carrier signal (please refer to claim 1). It would have been obvious to one of ordinary skill in the

art at the time of the applicant's invention was made to have the message encrypted before embedding it into the carrier signal in the data hiding steps as taught by Nakamura for the purpose of secure transmission. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Koninkl to obtain the claimed invention.

6. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koninkl in view of Nakamura as applied to claim 1 above, and further in view of Sandford, II et al. (US Patent 5,970,140, "Sandford" hereinafter).

Regarding claims 4-5, as applied to claim 1 above, the combination of Koninkl in view of Nakamura discloses the claimed invention including embedding the encrypted message into the LSB plane of digital image, but fails to disclose having a digital image with a plurality of color planes. Sandford discloses embedding information into a three color planes of the 24-bit Truecolor-format image (col 6, line 4-11). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use a digital image with a plurality of color planes to hide the message as taught by Sandford for the purpose of hiding more data and having composite image preserved the appearance of the original image. Therefore, it would have been obvious to employ the teachings of Sandford within the combination of Koninkl and Nakamura to obtain the claimed invention.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koninkl in view of Nakamura as applied to claim 9 above, and further in view of Bruce Schneier (Applied Cryptography, second edition, "Schneier" hereinafter).

Regarding claim 10, as claim 9, the combination of Koninkl in view of Nakamura discloses using a key to encrypt a message. Nakamura fails to disclose exchanging the key by using a trusted third party. Schneier discloses using a public-key certificate to certify the sender's information by certification authority (CA). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use the service provided by a trusted third party as taught by Schneier for purpose of authenticating the key being sent to a receiver. Therefore, it would have been obvious to employ the teachings of Schneier within the combination of Koninkl and Nakamura to obtain the claimed invention.

8. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter) in view of Sandford, II et al. (US Patent 5,970,140, "Sandford" hereinafter).

Regarding claim 12, Nakamura discloses providing an encryption key. Nakamura fails to teach the encryption key is a public key for an asymmetric encryption algorithm. Sandford discloses the security of the embedded data require protection of the key. One way of protecting the key is to encrypt it using public-key, or another encryption process. The present invention permits an encrypted key to be placed into the host image file, preventing extraction by unauthorized persons. (col 11, line 39-44). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use a public key as an encryption key as taught by Sandford for the purpose of providing a convenient way of extracting message from the composite image by an authorized person since a public key is public to anyone. Therefore, it would have been obvious to employ the teachings of Sandford within the system of Nakamura to obtain the claimed invention.

Regarding claim 13, Nakamura discloses data to be embedded into image (page 50, last sentence). Nakamura fails to teach the image the carrier signal can be selected from the group of digital images, digital audio, and digital video. Sandford discloses a method of embedding auxiliary information into the digital representation of host data. The digital representation of host data includes digital representation analog signals, for example digital images. (Abstract) It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use digital image, digital audio or digital video

as a carrier signal as taught by Sandford for the purpose of broadening hiding a large amount of external data in the digital images. Therefore, it would have been obvious to employ the teachings of Sandford within the system of Nakamura to obtain the claimed invention.

9. Claims 14-18, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter) in view of Hardy et al. (US Patent 5,195,136, "Hardy" hereinafter).

Regarding claims 14-16, Nakamura discloses encryption sequences. However, Nakamura fails to teach the encryption sequence is a random number generated based on a linear feedback shift register (LFSR) and embed the encryption sequence by performing an exclusive-OR of the encryption sequence with the carrier signal. However, Hardy discloses a linear feedback shift register for providing a pseudo-random code, coupled to ciphering device, which is in turn coupled to an adder (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to use Hardy to generate encryption sequence for the key in Nakamura and perform the exclusive-OR operation as taught by Hardy for the purpose of generating a random sequence. Therefore, it would have been obvious to employ the

teachings of Hardy within the system of Nakamura to obtain the claimed invention.

Regarding claims 17-18, Nakamura discloses receiver has a proper key can recover both imagery and text data to meet the limitations of claims 17-18. (see Fig 7, "Key")

Regarding claims 26-27, these are data hiding apparatus claims with limitations as per claims 14-16, and are rejected as per claims 14-16.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Podilchuk et al (Digital Image Watermarking Using Visual Models, "Podilchuk" hereinafter) in view of Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter).

Regarding claim 24, Podilchuk discloses a method of exchanging data hidden in a carrier signal. Podilchuk fails to teach comprising the steps of encrypting the message prior to generating the signal including hidden data and decrypting the message after obtaining the message from the signal including hidden data.

Nakamura discloses the steps of encrypting the message prior to generating the signal including hidden data and decrypting the message after obtaining the message from the signal including hidden data.(see Fig 7). It would have been

obvious to one of ordinary skill in the art at the time of the applicant's invention was made to include the steps of encrypting the message prior to generating the signal and decrypting the message after obtaining the message from the signal as taught by Nakamura for the purpose of hiding the message in the image. Therefore, it would have been obvious to employ the teachings of Nakamura within the system of Podilchuk to obtain the claimed invention.

11. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhiro Nakamura et al. (A Unified Coding Method of Dithered Image and Text Data Using Micropatterns, "Nakamura" hereafter) in view of Koninkl Philips Electronics NV (EP 0 359 325 A1, "Koninkl" hereafter).

Regarding claims 28-29, Nakamura teaches data hiding apparatus including an encryption sequence generator, an encryption message generator, encrypted message embedder as per claim 25. Nakamura fails to teach the encrypted message embedder is configured to perform an exclusive-OR operation on LSB plane of the digital image. Koninkl discloses using an Exclusive OR operation of additional information signal and other bits of data words to determine the logic values of less significant bits (col 3, 1st paragraph). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention was made to configure the encrypted message embedder to perform an exclusive OR operation on LSB plane of the digital image as taught by

Koninkl for the purpose of reducing error in the signal values. Therefore, it would have been obvious to employ the teachings of Koninkl within the system of Nakamura to obtain the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Grace C. Lee whose telephone number is 703-305-0710. The examiner can normally be reached on Monday - Friday 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 703-305-1830. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

(GCL)
Grace C. Lee
Examiner
Art Unit 2132

GCL
10/27/2003


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